Department of Environmental Conservation
Response to Comments

For

Heatherdale Resources Ltd., Niblack Project

APDES Permit No. AK0053708

Public Noticed March 19, 2015 – April 17, 2015

July 31, 2015

Alaska Department of Environmental Conservation
Wastewater Discharge Authorization Program
555 Cordova Street
Anchorage, AK 99501

1 Introduction

1.1 Summary of Facility / Permit

The Niblack Project (Niblack) is an advanced stage exploration project located off Moira Sound on the southeast portion of Prince of Wales Island. Niblack is owned by Heatherdale Resources Limited (Heatherdale). The exploration targets are a series of volcanogenic massive sulfide deposits that contain copper, zinc, gold, and silver. Niblack consists of equipment and infrastructure, underground development for exploration, waste rock storage and disposal areas, and a wastewater treatment facility.

The Alaska Pollutant Discharge Elimination System (APDES) permit authorizes the discharge of treated wastewater into the Niblack Anchorage of Moira Sound. The APDES permit authorizes a mixing zone in Niblack Anchorage for copper, lead, mercury, nickel, and zinc.

1.2 Opportunities for Public Participation

The Alaska Department of Environmental Conservation (DEC or the Department) proposed to issue an APDES wastewater discharge permit to Heatherdale. To ensure public, agency, and tribal notification and opportunities for participation, the Department:

- identified the permit on the annual Permit Issuance Plan posted online at: http://www.dec.state.ak.us/water/wwdp/index.htm
- notified potentially affected tribes and local governments that the Department would be working on this permit via letter, fax and/or email
- posted a preliminary draft of the permit online for a 10-day applicant review and notified tribes, local governments and other agencies
- posted a public notice of the draft permit on the Department's public notice webpage and notified tribes, local governments and other agencies
- posted the proposed final permit online for a 5-day applicant review on July 16, 2015
- sent email notifications via the APDES Program List Serve when the preliminary draft, draft, and proposed final permits were available for review

The Department also requested comment from the Alaska Department of Fish and Game, the Alaska Department of Natural Resources (DNR), the National Marine Fisheries Service, the U.S. Environmental Protection Agency (EPA), and the U.S. Fish and Wildlife Service.

The Department received comments from 15 interested parties on the draft permit and supporting documents: 1) Alaska Power & Telephone Company, 2) Amak Towing Company, 3) Austin Powder West, 4) City of Craig, 5) EPA, 6) Greater Ketchikan Chamber of Commerce, 7) Heatherdale, 8) Ketchikan Gateway Borough, 9) Olson Marine, 10) Organized Village of Kasaan, 11) Southeast Alaska Conservation Council (SEACC), 12) Southeast Stevedoring Corporation, 13) Survey Point Holdings, 14)

TEMSCO Helicopters, and 15) Tyler Rental. The majority of the comments received were letters expressing support for the APDES permit.

The Department received comments from four interested parties on the proposed final permit and supporting documents: 1) DNR, 2) EPA, 3) Heatherdale, and 4) Ketchikan Gateway Borough.

This document summarizes the comments submitted and the justification for any action taken or not taken by DEC in response to the comments.

1.3 Final Permit

The final permit was adopted by the Department on July 31, 2015. There were changes from the public noticed permit. Significant issues are identified in the response to comments and have been accounted for in the final fact sheet for the permit.

2 General Support for the Permit

2.1 Comment Summary

Twelve parties submitted comments of general support for the permit.

Response:

DEC appreciates the comments of support.

3 Minor Comments

The Department received several comments that were minor typographical/formatting comments or were the same or very similar to comments that were submitted by other entities. The Department did not include these minor or duplicative comments in this Response to Comments Document, but as appropriate, did make necessary updates to the permit and fact sheet in response to the identified typographical/formatting errors, and addressed duplicative comments through one Department response below.

4 Comments on Effluent Limits and Monitoring Requirements

4.1 Comment Summary

Heatherdale requested that—in the event that pH is outside the permit limits—samples from the boundary of the mixing zone be used to evaluate compliance with water quality standards for pH.

Response:

The compliance point for APDES permits is prior to the point of discharge and not at the boundary of the mixing zone. Please see the response to Comments 4.3 and 5.2. The Department has determined that no change to the permit is warranted based on this comment.

4.2 Comment Summary

SEACC questioned DEC's rationale in using best professional judgement to set technology-based effluent limits since new source performance standards (NSPS) specify zero discharge of process wastewater.

Response:

NSPS for the mining and dressing of copper, lead, zinc, gold, silver, and molybdenum ores are found in 40 CFR § 440.104. NSPS state that "there shall be no discharge of process water to navigable waters ***from mills*** [emphasis added] that use the froth-flotation process alone, or in conjunction with other processes, for the beneficiation of copper, lead, zinc, gold, silver, or molybdenum ores or any combination of these ores." Niblack has no mill or beneficiation facilities. Therefore, effluent limitation guideline provisions governing the discharge of process wastewater from mills do not apply in this case.

EPA has not developed effluent limitation guidelines for mining exploration. However, NSPS in 40 CFR § 440.104 provide technology-based effluent limits for the discharge of pollutants in mine drainage. Mine drainage is defined as, "any water drained, pumped or siphoned from a mine." Although Niblack is not yet a mine, Heatherdale has permits for 6,000 feet of underground drift development and associated waste rock storage facilities. Given the similarities between this exploration project and an operating mine, DEC exercised best professional judgement in applying the technology-based effluent limits found in 40 CFR § 440.104 .

DEC would like to emphasize that this APDES permit applies only to the exploration phase of the Niblack Project and not to active mining or the beneficiation of ore. The Department has determined that no change to the permit is warranted based on this comment.

4.3 Comment Summary

SEACC believes that monitoring should be required at the boundary of the mixing zone to ensure that water quality standards are met outside of the boundaries of the mixing zone.

Response:

Monitoring in the permit complies with all regulatory requirements, and there is no regulatory requirement for monitoring at the boundary of a mixing zone. The compliance point for effluent limitations in Clean Water Act wastewater discharge permits (APDES and NPDES) is at the point of discharge (i.e., "end-of-pipe"). For environmental protection, effluent limits imposed at the end-of-pipe provide safety by limiting the absolute amount of pollutants discharged. Additionally, end-of-pipe sampling is safer for monitoring personnel than sampling at the boundary of the mixing zone. DEC maintains that, by design, the end-of-pipe compliance program makes monitoring at the boundary of a mixing zone superfluous.

The CORMIX 5.0 mixing zone model was used to determine the size of the regulatory mixing zone in the permit. CORMIX has been shown by practical laboratory and ambient demonstrations, monitoring results, and dye studies at outfalls to provide reasonable estimates of mixing zone sizes.

The size of the regulatory mixing zone is an estimate. However, it is an estimate built upon very conservative assumptions. In developing the CORMIX mixing zone model, DEC assumed a "worst case" scenario for pollutant concentration and current velocity and took background concentrations in the receiving water into account (please see the response to Comment 5.4). Even under these worst case

conditions, the CORMIX model predicts that the mixing zone satisfies all regulatory requirements. In conclusion, all of the data and modeling suggests that water quality standards will be met a very short distance from the end of the discharge pipe. The Department has determined that no change to the permit is warranted based on this comment.

4.4 Comment Summary

SEACC commented that an empirical assessment of all designated uses of the water body is needed before the Department can conclude that all designated uses are protected.

Response:

In the development and writing of the permit, the Department's primary goal was to protect all designated uses of the state's waters. Niblack Anchorage, a marine water, constitutes the waterbody that requires protection in this permitting action. Alaska has developed seven protected water use classes for marine waters, all of which apply in this case. Water quality standards for the protection of these water use classes are provided in 18 AAC 70.020 (13)-(24) and the *Alaska Water Quality Criteria Manual for Toxic and Other Deleterious Organic and Inorganic Substances*. By ensuring that these water quality standards are met, the designated uses of the water body are protected.

As part of the permitting process DEC ensured that all relevant standards for protection of the designated uses of the waterbody were applied to the permittee. This was accomplished by analyzing historical effluent data, determining if there is a reasonable potential for the discharge to exceed water quality standards, and developing effluent limits and a monitoring program that will ensure that all designated uses are protected. The Department has determined that no change to the permit is warranted based on this comment.

5 Comments on Mixing Zone

5.1 Comment Summary

Heatherdale stated that the authorized mixing zone is only for copper and zinc. The permit authorizes a mixing zone for copper, lead, mercury, nickel, and zinc.

Response:

The reasonable potential analysis demonstrated that the maximum expected concentrations of copper, lead, mercury, nickel, and zinc exceed water quality standards at the point of discharge. Therefore, a mixing zone is required for each of these parameters as long as 18 AAC 70.240-270 is satisfied. The Department has determined that no change to the permit is warranted based on this comment.

5.2 Comment Summary

Heatherdale requested that a note be added indicating that there is a mixing zone for pH.

Response:

DEC authorized a mixing zone for copper, lead, mercury, nickel, and zinc in the draft permit. During the public comment period, Heatherdale provided evidence and justification for a pH mixing zone in compliance with 18 AAC 70.260. DEC has determined that a mixing zone for pH meets all regulatory requirements. Consequently, a pH mixing zone has been authorized.

The Department has exercised best professional judgement in developing a technology based-effluent limit for pH (please see the response to Comment 4.2). The effluent limit for pH is a range of 6.0-9.0 standard units, which comports with the technology-based effluent limit and reflects that a pH mixing zone has been authorized. The permit and fact sheet have been updated in accordance with these changes.

5.3 Comment Summary

SEACC commented that a mixing zone is not necessary because the wastewater treatment facility has chemical mixing tanks that could be used to produce effluent that meets water quality standards.

Response:

The Department's regulations for authorizing a mixing zone are found in 18 AAC 70.240-270 (June 26, 2003). The Department authorized the mixing zone in conformance with 18 AAC 70.240-270 (June 26, 2003). Please see Section 4.3 of the fact sheet.

Particularly relevant to this comment is the requirement in 18 AAC 70.240(a)(3) that, "an effluent or substance will be treated to remove, reduce, and disperse pollutants, using methods found by the department to be the most effective and technologically and economically feasible, consistent with the highest statutory and regulatory requirements."

Wastewater is currently passively treated through a series of settling ponds. These ponds provide enough retention time to reduce metal loads and consistently produce a high quality effluent. When discharged to Niblack Anchorage, all water quality standards will be met outside the boundary of a small mixing zone that meets all statutory and regulatory requirements.

Use of the chemical mixing tanks would require continuous, on-site supervision and the continuous expenditure of resources, such as fuel and materials. Since Niblack is a remote site that is in a period of temporary closure, with minimal staffing, use of the mixing tanks is not an economically feasible treatment option. After considering all of the requirements in 18 AAC 70.240(a)(3), DEC finds the passive system that is currently in use to be "the most effective and technologically and economically feasible" treatment system. Section 6.0 of the fact sheet was updated in response to this comment.

5.4 Comment Summary

SEACC commented that DEC does not have sufficient information on the "physical, biological, and chemical characteristics of the receiving water" to authorize a mixing zone. In particular, more information is needed on background concentrations in the receiving water.

Response:

Under 18 AAC 70.245(b)(1), the Department must, "…consider the physical, biological, and chemical characteristics of the receiving water including volume and flow rate." These aspects were considered and this regulatory requirement satisfied.

Heatherdale furnished all information necessary for DEC to determine that the authorized mixing zone meets statutory and regulatory requirements. Heatherdale submitted all required physical data for the receiving water including current velocity, temperature, water depth, and water density. Heatherdale provided this information in the Department's *Application Form 2M: Request for a Mixing Zone*. Please

see Section 4.3 and Appendix B of the fact sheet for a description of these parameters and how they were used.

Baseline marine water quality data was collected in May and October of 2007 from three different depths in the water column. These water samples were tested for salinity, pH, and a suite of chemicals and dissolved metals. For this permit, copper determines the size of the mixing zone. The background copper concentration was measured at 0.39 µg/L.

The physical and chemical characteristics of the receiving water were used as inputs to the CORMIX model. CORMIX is an EPA supported mixing zone model that has been shown to provide reasonable estimates of mixing zone sizes. CORMIX modeling indicates that the mixing zone meets all requirements for size and passage of aquatic life in 18 AAC 70. Outside of the mixing zone, all designated uses—including growth and propagation of fish, shellfish, other aquatic life, and wildlife— are maintained.

Section 4.3 and Appendix B of the fact sheet were updated in response to this comment. These sections now include a more comprehensive discussion of the sources of ambient data and how ambient data was used in determining effluent limits.

5.5 Comment Summary

SEACC commented that DEC failed to consider the effect of fresh water inflow to the receiving water. These effects include: elevated metals concentrations, stratification, and density changes.

Response:

DEC agrees that the density in Niblack Anchorage is stratified. Consequently, DEC developed a new CORMIX model in which the ambient density is modeled as stratified with an assumed linear density profile (see *CORMIX User Manual*, pg. 49.) The linear density profile selected best fits the measured temperature and salinity data submitted by Heatherdale in their application for a mixing zone.

The revised CORMIX model did predict a larger regulatory mixing zone. The mixing zone in the draft permit had dimensions of 8.34 meters (m) by 3.08 m. The corrected CORMIX model predicts a mixing zone of 9.03 m by 11.82 m. Although modestly larger in area, the revised mixing zone still meets all statutory and regulatory requirements. Section 1.5 of the permit and Section 4.3 of the fact sheet have been updated to incorporate the predictions from the revised mixing zone model.

The CORMIX model also did consider background metals concentrations in Niblack Anchorage (please see the response to Comment 5.4). Section 4.3 and Appendix B of the fact sheet explain how measured background concentrations in the receiving water were used in developing the permit.

5.6 Comment Summary

SEACC commented that the current velocities (as written in the fact sheet) that were used to determine the times required for a drifting organism to pass through the mixing zone are different than the current velocities used in the CORMIX model.

Response:

The current velocities referenced in SEACC's comments are from a draft version of the CORMIX model. The current velocities listed in the fact sheet are correct, and these same velocities were used in the final

CORMIX model. The Department has determined that no change to the permit are warranted based on this comment.

5.7 Comment Summary

SEACC commented that the maximum expected concentration (MEC) of copper (160.18 µg/L) is different than the copper concentration used in the CORMIX model (159.8 µg/L).

Response:

The concentration used in the CORMIX model does not match the MEC if the receiving water has a background concentration that has been accounted for in the model. CORMIX requires that a pollutant concentration be input as the excess concentration above the background value (see *CORMIX User Manual*, pg. 61). The background copper concentration in Niblack Anchorage is 0.39 µg/L. This background concentration must be subtracted from the MEC to determine the correct copper concentration to use in the CORMIX model. In this case, the excess concentration above background is 159.8 µg/L. The Department has determined that no change to the permit is warranted based on this comment.

6 Comments on Permit Conditions

6.1 Comment Summary

EPA recommended changing the dilution series used for whole effluent toxicity (WET) testing from control, 0.5%, 1%, 2%, 4%, 8% to control, 1%, 2%, 25%, 50%, and 100%.

Response:

Since no WET data exists, DEC agrees with EPA's recommendation and has updated the permit accordingly.

6.2 Comment Summary

EPA asked that DEC ensure that the timing of WET testing (Table 2 of the permit and fact sheet) allow for the second WET test to be available in advance of permit reissuance.

Response:

DEC will ensure that the condition is met. The Department has determined that no change to the permit is warranted based on this comment.

6.3 Comment Summary

EPA recommended changing the language in Permit Part 1.4.1.1.1 to make it clear that toxicity tests should be initiated within 36 hours of sampling.

Response:

DEC agrees with EPA's recommendation and has updated the Permit Part 1.4.1.4.1 accordingly.

6.4 Comment Summary

EPA recommended that the annual best management practices (BMP) certification required under Permit Part 2.2.5.2 be included in Table 1, Schedule of Submissions with a due date of January 31st of the following year.

Response:

DEC agrees with EPA's recommendation and has updated the permit accordingly.

6.5 Comment Summary

EPA recommended that DEC require the permittee to submit written notice that the operation and maintenance (O&M) manual has been developed and implemented.

Response:

DEC agrees with EPA's recommendation and has updated the permit accordingly.

6.6 Comment Summary

Heatherdale requested that the requirement for providing written documentation of noncompliance be changed from five days to five "business days."

Response:

DEC's standard for providing written documentation of noncompliance is five days. For expediency, the written documentation may be submitted by email as discussed in Appendix A, Section 3.4. The Department has determined that no change to the permit is warranted based on this comment.

6.7 Comment Summary

Heatherdale commented that Section 1.4.1.1 of the permit is inaccurate. The permit states that a 7-day chronic survival test for *Mytulis galloprovincialis* (blue mussel) is required, but this test is a 48 hour larval development test.

Response:

DEC agrees with Heatherdale and has corrected the permit.

6.8 Comment Summary

Heatherdale requested that one alternative species for each type of WET testing be added to Section 1.4.1.1 of the permit. Heatherdale suggested that *Menidia beryllina* (inland silverside) be added as a substitute for *Atherinops affinis* (topsmelt) and that *Crassostrea gigas* (Pacific Oyster) be added as a substitute for *Mytulis galloprovincialis* (blue mussel).

Response:

Given the short hold times for WET testing, DEC finds Heatherdale's request to include one alternate species for each type of WET test to be reasonable. The species suggested by Heatherdale are consistent with EPA methods referenced in the permit (e.g., *Short Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to West Coast Marine and Estuarine Organisms*) and have been incorporated into Section 1.4 of the permit.

6.9 Comment Summary

Heatherdale believes that Section 1.4.1.5 of the permit—which requires screening and approval prior to using an alternate species for toxicity testing—conflicts with Section 1.4.1.1, which only requires a written request and approval to use an alternative species for toxicity testing.

Response:

Section 1.4.1.1 of the permit addresses the case where the target species are "not available at the time of testing." This section applies to a short term variance in permit conditions due to unforeseen events. In this case, written approval for the use of an alternative species, without screening, is acceptable.

Section 1.4.1.5 of the permit addresses the case where the permittee would like to permanently switch to an alternate species. Screening and written approval is required in this case to demonstrate that the proposed species provides results that are comparable to the standard species in the permit. The Department has determined that no change to the permit is warranted based on this comment.

6.10 Comment Summary

Heatherdale requested a different dilution series for WET testing of the *Mytulis galloprovincialis* (blue mussel) during the 5-day review period for the proposed final permit. Comments about the dilution series were also submitted during the 10-day applicant review as well as the public notice period.

Response:

Since freshwater effluent from the Niblack Project will be used to perform WET testing on the blue mussel, a marine organism, hypersaline brine must be added to the diluted effluent. DEC agrees that the blue mussel does not respond well to the use of the salts in the brine and, consequently, testing with 100% effluent is not practical. In response to Heatherdale's request, DEC has changed the dilution series for the blue mussel from 1%, 2%, 25%, 50%, and 100% to 6%, 13%, 25%, 50%, and 65%. Section 1.4 of the permit was modified in response to this comment.

7 Comments on the Permit and Fact Sheet Template

7.1 Comment Summary

EPA commented that the flow limits in Table 2 of the permit are inconsistent with the flow limits in Table B-4 of the fact sheet.

Response:

Table B-4 of the fact sheet was updated with the correct flow limits.

7.2 Comment Summary

EPA commented that the fact sheet should provide the calculations for all water quality-based effluent limits.

Response:

The fact sheet has been updated with sample calculations that clearly demonstrate the methodology used to calculate the water quality-based effluent limits.

7.3 Comment Summary

Heatherdale commented that the coordinates for outfall 001 in the permit are incorrect.

Response:

The permit was updated with the correct outfall coordinates.

7.4 Comment Summary

Heatherdale requested that "30-day average" be defined in Appendix C.

Response:

A definition of 30-day average is provided in Appendix C.

7.5 Comment Summary

Heatherdale commented that the discussion of compliance levels in Section 1.2.6 of the permit is ambiguous and suggested rewording the last sentence.

Response:

DEC agrees with Heatherdale and has updated Section 1.2.6 with the language suggested by Heatherdale.

7.6 Comment Summary

Heatherdale requested that the words "and to help explain data anomalies whenever they occur" be removed form Section 2.1.2, which discusses the quality assurance project plan (QAPP). Heatherdale suggested alternate wording for Section 2.2.2.

Response:

DEC believes that a well-designed QAPP can help to explain data anomalies. The Department has determined that no change to the permit is warranted based on this comment.

7.7 Comment Summary

SEACC commented that the discussion of the social and economic benefit of the project in Section 6.0 of the fact sheet was unpersuasive.

Response:

There is no regulation or guidance that specifies a minimum threshold of "economic or social development" that justifies degradation. This issue must be considered on a case-by-case, site-by-site basis. The Department determined that the potential economic and social benefits of a potential large mine or major exploration project would be significant to the small communities of southeast Alaska, which justifies the discharge authorization while the project is under temporary closure. It should be noted that this permit does not apply to the project should it proceed to development and operation of a mine. The Department has determined that no change to the permit is warranted based on this comment.

8 Comments on Reasonable Potential Analysis and Water Quality Based Effluent Limit Calculations

8.1 Comment Summary

EPA commented that the reasonable potential multiplier (RPM) for copper in Table B-3 of the fact sheet is incorrect if based on a 95% confidence interval and 95% probability basis.

Response

The RPMs in Table B-3 of the fact sheet are based upon a 95% confidence interval and 99% probability basis. Please see the response to Comment 8.2 for additional information about how DEC calculates RPMs. The Department has determined that no change to the permit is warranted based on this comment.

8.2 Comment Summary

EPA requested additional information about the derivation of RPMs during the 5-day review period for the proposed final permit.

Response

The *Alaska Pollutant Discharge Elimination System (APDES) Permits Reasonable Potential Analysis and Effluent Limits Development Guide* is used by DEC to perform reasonable potential analysis and develop limits for APDES permits. Pages 17-18 of the *Guide* address the derivation of RPMs.

In developing RPMs, DEC begins with a statistical analysis of effluent data using the software package ProUCL. Based on this analysis, the permit writer selects the most appropriate statistical distribution for the effluent data. Statistical distributions used by DEC include: 1) normal, 2) lognormal, 3) log-ROS, 4) non-parametric (Kaplan-Meier), and 5) gamma.

The selected statistical distribution determines which formula is used to calculate the RPM. For the non-parametric (Kaplan-Meier), normal, and gamma distributions, the formula in Section 2.4.2.1 of the *Guide* is used. For the lognormal and log-ROS distributions, the formula in Section 2.4.2.2 of the *Guide* is used. Both of these formulas can also be found in Appendix E of EPA's *Technical Support Document for Water Quality-based Toxics Control*. The table below lists the statistical distribution selected for each effluent parameter.

Parameter	Statistical Distribution
Arsenic	Non-Parametric (Kaplan-Meier)
Cadmium	Non-Parametric (Kaplan-Meier)
Chromium	Non-Parametric (Kaplan-Meier)
Copper	Lognormal
Lead	Gamma
Mercury	N/A (only one detected value)
Nickel	Non-Parametric (Kaplan-Meier)
Selenium	Non-Parametric (Kaplan-Meier)
Silver	Non-Parametric (Kaplan-Meier)
Zinc	Non-Parametric (Kaplan-Meier)

The Department has determined that no change to the permit is warranted based on this comment.